

**Abstract of the Disclosure**

A pulse sequence is configured by making a pulse waveform output from a pulse light source into a super 5 Gaussian pulse of the third order or higher, and input to a spectrum expanding device. The spectrum expanding device broadens the spectrum of the pulse sequence with a nonlinear medium. A modulator array extracts longitudinal mode components from the expanded spectrum, 10 and modulates the extracted longitudinal mode components with modulation data. Lastly, the modulated longitudinal mode components are coupled and transmitted to a transmission line.